THE IMPACT OF THE MEDIA ON FALSE PUBLIC PERCEPTION OF TORNADO SAFETY PRECAUTIONS

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ON FALSE PUBLIC PERCEPTION OF

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NOMENCLATURE

AMS – American Meteorological Society (Boston, MA)

KTV – Kansas Turnpike Video

NOAA – National Oceanographic and Atmospheric Administration (Washington, D.C.)

NSSFC – National Severe Storms Forecast Center (Kansas City, MO)

NSSL – National Severe Storms Laboratory (Norman, OK)

NWS – National Weather Service (Silver Spring, MD)

SPC – Storm Prediction Center (Norman, OK)

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CHAPTER I

INTRODUCTION

Background And Problem

On April 26, 1991, there was a significant outbreak of severe weather across the Southern Plains region of the United States. Severe thunderstorms developed rapidly across portions of Oklahoma, Kansas, and other states in the region. These storms quickly grew to severe levels and subsequently produced a tornadic outbreak that altered the course of life for the individuals that experienced this severe weather event and beyond.

One of these experiences was documented on video and would become one of the most dramatic tornado events ever experienced by those involved and for those who would witness the awesome fury that nature has to offer. This video was widely disseminated throughout the media and continues to be distributed to the public a full fourteen years later, and likely will be for many years to come. The Kansas Turnpike Video (hereafter, KTV), as it has been popularly named, is one source of a growing problem within an area that experiences the greatest risk for tornadoes, Tornado Alley. This problem is the growing number of people who seek shelter from severe thunderstorms and tornadoes under overpass bridges. This research argues that the media play a key role in the problem that the public receives the wrong message as to which safety precautions should be taken if faced with a similar situation.

It is not only this video that has perpetuated this tornado safety myth, but there are other factors also that have contributed to this growing problem. Lack of an organized attempt by the mass media to correct the misperception continues to allow this overpass safety myth to thrive in our society. Media sources that air this video may not provide viewers with a disclaimer that illustrates the dangers inherent with the safety myth. The media assist the continued misconceptions of the tornado safety myth by not adequately illustrating the dangers to the public. Instead, the video is used as entertainment and for drama value instead of discussing the luck involved in the KTV, and how the individuals featured in the video performed safety precautions that conflict with official guidelines.

The facts involved with the video can be difficult to discern when taken at face value. There are many random factors involved which assisted the survival of these people in this particular situation. Yet these facts are not easily detected by those who witness the video. Without corrective information or a disclaimer, exposure to the KTV will confuse people on what to do if faced with a similar situation. Viewers are left with the wrong impressions of what precautions to take if they ever find themselves in this predicament.

This video assists certain members of the public to alter their perception of reality. In this part of the country (Oklahoma), tornado preparedness is something that the majority of the population encounters regularly. This group of people becomes a subculture of the population of the United States due to their increased awareness of severe weather and tornado preparedness precautions. This subculture begins to identify and construct a version of collective "reality" that guides their lives within the subculture by providing language, beliefs, principles, rules, regulations, etc., that are specific to that particular subculture and support the subculture structure. By exposure to the media and the KTV,

individuals begin to construct their own incorrect versions of reality, even if it goes against the teachings of the subculture. The KTV and videos like it reinforce potentially harmful behaviors, even in a region of the country that is characterized by a "disaster subculture" (Wenger and Weller 1973). Presumably this disaster subculture makes this area more resilient in the face of calamity. However, tornado safety myths, such as the one perpetuated in the KTV, actually make people in that region more vulnerable to death or injury in a tornado. In short, the disaster subculture exists to help and assist those who live within it, but when one element of that subculture provides its members with misinformation, it can in fact be detrimental to society.

The Purpose of the Study

The purpose of this study is two-fold. First, this study asks the question: To what extent do the media play a role in the public's social construction of "reality" in relation to risk perception? Second, it also investigates the impacts of certain demographic variables on respondents' levels of tornado safety knowledge. These questions are addressed through a quasi-experimental research design. Specifically, students enrolled in Sociology classes at a major university located within Tornado Alley will complete a pre-test questionnaire on tornado safety, view the KTV, and complete a post-test questionnaire. If accurate levels of tornado safety decline following exposure to the KTV, then it can be concluded that the media actively shape public perceptions of risk and potentially reduce rather than improve tornado safety.

There have been many studies conducted which attempt to illustrate the growing dependence of individuals on television as not only a source of entertainment, but also a source of information. The majority of these studies conclude that Americans are deeply

influenced by what they view on their television screens. In a sense, their perception of the world and of "reality" can be altered by local and national news outlets as well as by documentaries and entertainment programs.

Significance of the study

This study has both conceptual and applied implications. In a conceptual sense, it contributes further to our understanding of the role of the mass media in contemporary society. In an applied sense, some of the findings of this research may assist persons in the media and field of meteorology in finding solutions to this growing problem. If certain demographic variables can be discovered to correlate with the decisions that people make when faced with a dangerous weather situation, then perhaps they would have a new approach in correcting the public's perception of what to do if faced with a tornado on an open highway.

Although the overpass safety myth has been discussed widely in certain circles such as emergency management, meteorology, and storm chasing, very little research has been conducted on this specific topic. While numerous studies have been conducted more broadly on risk and the media, this study fills a void by focusing specifically on the Kansas Turnpike Video and its social consequences.

Preview of the Remaining Chapters

Chapter Two provides a review of relevant literature. It is divided into two major sections: a review of meteorological research related to the KTV and a review of sociological research on risk, disaster, and the media. Chapter Three describes the quasi-experimental research design employed in the study. It also presents the results of a pilot

test that was conducted. Chapter Four presents the major results of the study, and Chapter Five provides concluding remarks and discusses the implications of the study.

CHAPTER II

REVIEW OF LITERATURE

A. History

To properly analyze how the public perception of risk is affected by the media, it will be necessary to understand previous research conducted on topics related to this research. A proper place to begin is to describe the origins of the overpass safety myth. We must look at examples provided by the media, including the KTV from April 26, 1991, a video in which a television news crew and a family sought shelter under the girders of an overpass bridge and videotaped a tornado as it passed over or near them. They emerged unscathed and continue to tape the "unfortunate" people who "didn't make it to the overpass." The KTV and other videos and photos, along with their extensive replay and publicity, have helped to alter the way in which people have reacted to a tornadic threat on the highways of America.

Historical Aspect of the Problem. This study is inspired in large part by a talk presented at the 24th annual meeting of the National Weather Association in 1999. This presentation was delivered by Dan Miller, a forecaster at the National Weather Service Forecast Office in Norman, OK.

The topic of the NWS presentation involved seeking shelter beneath overpasses when confronted with tornadic thunderstorms on open highways. The 1991 KTV and similar videos and photos have gained much exposure throughout the mass media and

their extensive replay has negatively altered public perception of tornado safety. In his study, Miller analyzes this video and compares it with the public's behavior during the May 3, 1999, Oklahoma tornado outbreak from a meteorological perspective, (www.srh.noaa.gov/oun/papers/overpass/slide01.html).

On this date a massive outbreak of severe weather and tornadoes swept across portions of the Great Plains. The bulls-eye of this activity was central Oklahoma, during which an incredible F-5 tornado (wind speeds of 261 to 300+ mph) erased portions of the Oklahoma City metropolitan area and other locations around the region. During this major weather event, many people sought shelter from these storms underneath overpasses. Several deaths and scores of injuries were reported from those unfortunate enough to seek refuge in this location while experiencing a direct hit from the highest-intensity tornado possible. Further research would show that the construction of these overpasses was not sufficient protection from a tornado of most magnitudes, especially a massive F-5.

The numbers of people who stop underneath overpasses and leave their vehicles to seek shelter also create a dangerous situation. This roadblock prevents other drivers from proceeding to a possibly safer location and causes them to worsen the traffic situation. This unnecessary traffic jam can also prohibit the flow of emergency management vehicles attempting to keep up with the storm and its results.

Particularly troubling are the individuals who left their sturdy, well constructed homes and fled in their vehicles to find overpass bridges to seek shelter. This is an especially dangerous maneuver which exposes the individual to a much greater risk of

injury or death. It also helps to significantly worsen the problem, most notably in large urban areas.

Weather Agencies Respond. The National Weather Service (NWS), lead by the Miller campaign, has provided many sources of research on this topic. They have released this Miller study which has had far-reaching effects on the public dissemination of information on overpass safety and lack thereof. In addition to this we see that the Storm Prediction Center (SPC), the American Meteorological Society (AMS), and the National Severe Storms Laboratory (NSSL) have included in their official guides to tornado safety specific segments devoted to the overpass problem. Important to this particular research is how nearly all of these sources point specifically to the explicit overplay of the KTV as one culprit for the resilience of the false public perception of tornado safety.

Each and every one of these agencies has noticed that this problem is growing and attempt to battle this false perception. However, despite their efforts, the problem persists. And public perception continues to show the influence of the media in shaping how people take shelter from tornadic storms.

Other literature necessary to build a full picture of the scale of the problem comes in the form of official documentation from state and federal agencies that have begun a marginally effective campaign to curb the practice of seeking shelter under an overpass. Emergency management offices from several counties of interest have provided information where we can see the official stance of public officials dedicated to public safety. The city of Moore, Oklahoma, emergency management office is an interesting bit of information because not only was this portion of Oklahoma City devastated on May 3,

1999, but it is also the site where numerous individuals sought shelter under the overpass bridges in the area. It is also the site where the I-35 bridge was the final resting place of a woman whose family participated in this deadly practice. They have a press release entitled "Highway Overpasses as Shelters" and this release is based on the Miller study with the NWS (www.ci.moore.ok.us/emermgmt/bridges.htm).

This release provides a brief overview of the Miller study and points out some of the major problems with overpass shelters. Most notable, aside from their discussion of deadly consequences, is their emphasis on the blocking of the highway by motorists who abandon their vehicles causing a total stoppage of the free flow of traffic. This causes several problems such as the blockade forcing others to abandon their vehicles causing more of a back up, accidents resulting from people who do not see the blockade amid the chaos, and the prevention of emergency vehicles from accessing the areas that need assistance.

They also mention the problem of people who leave the relative safety of their homes and drive to highway overpasses to seek shelter. Not only do they place themselves at greater personal risk, but they also contribute to the traffic problem. Another of these emergency management offices of note is the Sedgwick County, Kansas, office which experienced the deadly tornadoes of April 26, 1991. Sedgwick County borders Butler County, where the infamous KTV was taken. The official tornado safety precautions on this site provide brief and basic examples of what to do if caught in this situation; however most of the page is devoted to an explanation of the overpass shelter problem (http://www.sedgwickcounty.org/emermgmt/tornado_shelters.html). These two sources are important to provide us with knowledge that the officials

responsible for public safety recognize this problem and are devoting a good deal of effort to correct the public's inclination to continue the practice. However, the media obsession with the graphic displays captured in the KTV and other sources continue to undermine their efforts.

Another example of this is seen on the Labette County, Kansas, emergency management site, which also includes a special page devoted to correcting this public perception. They even provide a link which allows the viewer to download the official National Weather Service brochure, which clearly lays out nearly all of the tornado preparedness information that members of the public could utilize. They are used to illustrate the point that not only just these, but nearly every emergency management office and federal agency is actively participating in an attempt to curb this dangerous practice of seeking shelter underneath overpasses.

A study conducted by Dr. Rocky Lopes of the American Red Cross National Headquarters Disaster Services Division illustrates the point that exposure to disaster images that utilize damage are far more likely to be remembered by those who see them compared to disaster images that have no damage in them:

> "These data show that people who saw disaster images were more confused after the presentations about the right things to do. Since slides in the presentations that did not include disaster images portrayed people 'doing the right thing,' these data indicate that visual learning was reinforced by the message that they heard (Zemke, 1988). People feel they know the right thing to do when they both see it and hear it. They become confused when they hear the right thing to do, but see damage images (what to avoid) instead. These data reinforce that people need to be shown and told the right thing to do, rather than be shown what could happen if they do not do the right thing (Drabek, 1986)" (Lopes 1992: 17).

The Lopes study illustrates why this perception prevails and provides an approach to correcting the problem. Exposure to the KTV may confuse people on what to do if

faced with a similar situation. According to the Lopes study, if people are shown a video of people seeking shelter in a ditch near an overpass and surviving, while other videos show that those under the overpass are injured, and if this practice is properly explained while doing so, an alteration of public perception can be accomplished successfully.

Meteorologists and Mass Media. On the website of Roger Edwards, who is a meteorologist and storm observer with the SPC, NSSL, National Severe Storms Forecast Center (NSSFC), and the NWS, provides a very well organized argument about the overpass problem. This excerpt from his site provides a basis for his strong opinions on the topic:

> "The old NOAA film, *Terrible Tuesday*, documented someone who "survived" the Wichita Falls tornado of 10 April 1979 under a bridge. This film has been seen by millions, and may be the source of some bad lessons about bridges and safety being taught in schools. But another even more hideous video has led to a much more vast spread of this safety myth. During the 26 April 1991 outbreak, a TV news crew (who could have easily evaded the tornado at interstate driving speeds) instead decided to *become* the news and make glory for themselves. They drove along with, and just ahead of the tornado, then stopped to film the tornado from under some bridge girders, keeping the camera rolling as the tornado passed nearby, not overhead (little-publicized fact: They were in the surface inflow jet!)...and filming the tearful and lucky survivors" (Edwards: Updated 2-7-02).

One element of what Edwards has to say really sticks out. He exclaims that the *Daily Oklahoman* newspaper is the only mass media source that has undertaken a serious campaign to curb overpass shelter behavior. Since the events of May 3, 1999, other newspaper sources have arisen that have shown at least a minimal effort in correcting this problem. The *USA Today*, one of the leading national newspapers, ran a few articles strictly devoted to the overpass shelter safety myth. They define the problem, provide examples of why it is a significant problem, and provide some key eyewitness accounts by victims of tornadoes who had fallen prey to the safety myth. Through this research,

there does appear to be a least a small attempt to correct the false public perception of tornado safety.

Edwards also mentions Dan Miller's NWS study on which this research is based. He and others with the NSSL have attempted to persuade the American Meteorological Society (AMS) to launch an intensive campaign to alter public perception of tornado safety, but at the time of this website update nearly two years ago, this has not yet been accomplished. The official policy statement by the AMS provides five pages of tornado preparedness information with one paragraph mentioning the overpass problem.

Storm Chasers. These are individuals either employed with media networks, members of the scientific and educational community, or persons who make their living by photographing and videotaping these forces of nature for entrepreneurial purposes. Some of the more well-known chasers, such as Gene Rhoden, Jeff Petrowski, Roger Edwards, Tim Marshall, and Dr. Howard Bluestein with the University of Oklahoma School of Meteorology are notable among many who spend countless hours on America's roadways in search of these monster storms. Their experience allows them to find such storms with regularity, but also allows them to observe more about public behavior during such storms than most people witness. Nearly all of these chasers have provided information, either via Internet or through official media sources, which can help to explain that not only does this problem persist amidst the current campaign to change public perception, but this behavior seems to be getting more prevalent on the roads and highways of tornado prone areas.

Gene Rhoden even went so far as to conduct a survey of overpass construction across Oklahoma and Texas to analyze the degree to which those seeking shelter there

could weather a storm. His findings suggest that there are some types of overpasses that provide reasonable shelter, but it solely depends on the construction of the overpass and the type and strength of the tornado involved (Rhoden, Retrieved December 7th, 2004). Although this information could be beneficial, it will also add to the confusion of the public. With the current campaign to end this overpass shelter problem, this report will only serve to further complicate the problem. People already think that all overpasses offer protection, but with the official stance of no overpasses providing adequate shelter, Rhoden's study will provide the public with an even more confusing stance that only some overpasses provide adequate protection.

B. Sociological Literature and Perspectives

Social Construction of Reality and W.I. Thomas. To understand how people could develop a view of tornado safety that is inaccurate and potentially dangerous, the current study employs a social constructivist perspective. This approach, which was articulated by W.I. Thomas (1923) and spelled out by Berger and Luckmann (1966), argues that reality does not objectively exist; rather it is created through social interaction. When we look at how the media constructs reality and creates this false perception of tornado safety precautions, we must first define "reality" and how it applies to this topic. Berger and Luckmann refer to Karl Marx and his beliefs on the roots of human knowledge. "It is from Marx that the sociology of knowledge derived its root proposition – that man's consciousness is determined by his social being" (1966:5-6). It is the socialization process that helps to define an individual's personality, thoughts, and actions. In modern society, television and media play a large role in the individuals'

exposure to new thoughts and ideas. "What concerned Marx was that human thought is founded in human interaction…and in social relations brought about by this activity" (Berger and Luckmann 1966:6). We see that these authors strongly believe in the Marxian theories that human thoughts and actions are rooted in socialization from outside sources.

Berger and Luckmann argue that as our lives develop, we begin to acquire patterns of behavior that are repetitive. These patterns are known as habits and can become useful in that they allow us to react towards and handle recurring situations automatically and effectively. These habits that we develop also help others to interact with us. When we communicate face-to-face, each participant reacts to the other by relation to each other's habits; therefore, we eventually begin to anticipate or maybe even depend on the habits that we encounter in other people. Upon our continued development and the passage of time, some habits tend to become common, or shared, between the members of a particular society.

Many other authors and social scientists echo this sentiment but further relate this socialization process with the impact of the media on society in terms of social construction. One such author is Anthony Wilden (1987) who states that:

> "Many of our apparently unique personal opinions are in fact derived from social conditioning by dominant codes of values transmitted by others, beginning in the cradle and including the media of family, school, and popular entertainment, rather than from personal and informed decisions that we actually made for ourselves" (125).

This helps to convey the main point of Berger and Luckmann that external stimuli are key factors in the understanding and interpretation of the socialization process. Wilden (1987) expresses the importance of specific stimuli in this process and stresses the

importance of socialization within the family, peer groups, and popular entertainment, of which the media plays a major role since recent studies indicate that a large portion of American society spends their spare time playing video games, watching movies, and most predominantly, watching television.

It has been established that external stimuli play a key role in the socialization of the individual, but external stimuli alone do not transform the actions of people in a society. The external stimuli must be internalized and accepted as reality before they have an opportunity to become key players in peoples' attitudes, beliefs, and actions.

> "The individual, however, is not born a member of society. He is born with a predisposition toward sociality, and he becomes a member of society. In the life of every individual, therefore, there is a temporal sequence, in the course of which he is inducted into participation in the societal dialectic" (Berger and Luckmann 1966:129).

Berger and Luckmann argue that just being exposed to these stimuli do not lead directly to socialization within a larger society. The stimuli must be internalized by the individual and accepted as reality before they can become an inherent portion of their social being.

> "The beginning point of this process is internalization: the immediate apprehension or interpretation of an objective event as expressing meaning, that is, as a manifestation of another's subjective processes which thereby becomes subjectively meaningful to myself. This does not mean that I understand the other adequately. I may indeed misunderstand him…" (1966:129).

The previous quotation by Berger and Luckmann can be directly related to the purpose of this research. Everyone sees the same thing when viewing the KTV; however, what each person takes away from viewing the video can differ greatly. Some see the video as a legitimizing "how-to" guide as to what actions to take if faced with a similar situation, while others see it as a solidification of what not to do and see the participants

as being merely lucky. Is it possible that although we are all viewing the same media clip, we all come to different conclusions as to what it is that we are seeing?

As Berger and Luckmann continue their argument on internalization of society, it becomes apparent where this particular research begins to fit directly into their perception of socialization. When they discuss the role of secondary socialization, we can see the parallels between this and a disaster subculture, which we will further explore shortly. Berger and Luckmann argue that:

> "…Generally relevant knowledge, too, may be socially distributed-for example, in the form of class-based 'versions'-but what we have in mind here is the social distribution of 'special knowledge'-knowledge that arises as a result of the division of labor and whose 'carriers' are institutionally defined…The 'subworlds' internalized in secondary socialization are generally partial realities in contrast to the 'baseworld' acquired in primary socialization…they, too, require at least the rudiments of a legitimating apparatus, often accompanied by ritual or material symbols" (1966:138-139).

A disaster subculture can be looked at as an element of a society that is more knowledgeable about certain external forces of nature which present themselves in a particular region that other regions do not experience regularly, if at all. For example, if we look at the tornado awareness subculture, persons from Tornado Alley and regions in the middle of the United States are more knowledgeable about tornado safety preparedness than people from the coasts or outlying areas of the country that do not experience severe weather and tornadoes on as regular a basis. Similarly, Californians are socialized to accept earthquakes and earthquake preparedness as an inevitable companion, Canadians find ways of living through brutal winter storms, and Floridians learn to cohabitate with hurricanes as permanent acquaintances.

Those who live in this region become "carriers" of a "special knowledge", the "versions" of which are socially distributed through families, peers, and popular entertainment. Based upon this idea, we can see where the wrong information on tornado preparedness can be distributed throughout a society and perpetuated for a long period of time. The legitimating apparatus in this case would be media like the KTV, which are symbols that perpetuate throughout society by way of the media and legitimize certain aspects of society in the minds of the viewers.

This acceptance of the video by the public is further enhanced because it is:

1.) Defined by the perceptions of reality from those who watch it.

2.) Internalized through exposure to the video itself.

3.) And legitimized by receiving acclamation through receiving awards and widespread dissemination through other media outlets.

Regardless of the extensive replay of this video, further legitimization occurred when the television station (KSNW-TV; Wichita, Kansas) and the news crew (Ted Lewis and Gregg Jarrett) were nominated for a 1991 Heartland Emmy for Best News Segment: Spot News. The news crew and television station are rewarded for their actions and presented with awards for videotaping their encounter with a force of nature, further legitimizing the video in the eyes of the public. Members of a disaster subculture in Tornado Alley are more likely to internalize and remember the video and the actions performed on it for a longer period of time when it is nationally, regionally, or even locally acclaimed.

In 1923, a sociologist by the name of W.I. Thomas developed a chapter in his book, *The Unadjusted Girl*, to the examination of how people define, legitimize, and

internalize situations which they encounter in their lives. This chapter, fittingly entitled "Definition of the Situation", provides us with our first glimpse of the Thomas Theorem. In short, the Thomas Theorem can be defined by the following quotation, "If men define things (or situations) as real, they are real in their consequences" (Thomas and Thomas 1928:572). This quotation can be used in innumerable social-psychological contexts, most of which involve influence on individuals from external stimuli. For example, when a child takes a gun to school and shoots his or her classmates and teachers, the public tends to blame the music the child was listening to as a catalyst for this violent act. The same can be said for video games, movies, ***television***, radio, Internet, and other external sources of input, which certain groups prefer to blame for the actions of the individual.

As previously noted, it was Karl Marx who hypothesized that man's consciousness is derived from his social being. He and Friedrich Engels felt strongly that it is not the consciousness of men that determines their existence, but rather their social existence that determines their consciousness. Simply stated, human thought is founded by human activity. It is through our socialization that our perceptions of the world influence us to think, believe, and act in certain ways in response to certain situations. An increasing portion of this socialization is derived through the media, as our exposure to the various forms of media continues to increase with time and technological advancements.

In relation to this research, we can deduce using the Thomas Theorem that when people see videos like the KTV with no type of disclaimer or corrective information, when they feel that they are threatened with a similar situation, they will revert to what

they know and actions they have seen performed by others to protect themselves and those around them. Despite a marginally effective campaign by the National Weather Service and other media outlets, public perception remains that overpasses are sufficient sources of protection in tornadic weather. In a video shown during presentations for this topic, we see another video from the Kansas Turnpike taken two years ago (May 2003) by Doug Kiesling, in which a developing tornado passes very close to the camera and over the embankment of an overpass bridge. A family taking shelter under an overpass is chastised by a passing police car via the loud speaker. The officer tells the people that they have been told about bridges being dangerous places for shelter and they should get in a ditch. This response from the police officer provides an example that despite certain agencies attempting to alter public perception, the 1991 KTV and other media continue to perpetuate the false public perception of what to do in that situation.

Although this theory developed by Thomas would assist in the credibility of the Chicago school and the symbolic interactionist perspective, his Sociological theory would help to form a more complete understanding of the social-psychological aspects of public perception and decision making. Thomas discusses the role of the family as the primary defining agency in the lives of individuals. He continues by relating how the community is the secondary source of situation defining. The role of the media as a part of this community has definitely changed since Thomas wrote these words almost 80 years ago. Now the media play an important role in the definition of situations in everyday life.

But what happens when these definitions promote behavior that is undesirable in the eyes of those who are in a better position to define certain situations? Why is it that

this video continues to influence people despite the actions of professionals who continually show that it demonstrates poor judgment and attempt to redefine the situation? By using the Thomas Theorem in this context, perhaps we can find a solution to this conundrum and help others to realize that their perception of this situation and the appropriate reaction to it are altered by what they view on the television screen.

Public Perception of Risk. Another line of research relevant to the present study deals with risk perception. The existing literature shows that there are many forms of risk-perception. However, if we look at risk-perception from the social constructionist perspective, we can notice some trends that are relevant to this research topic. One of the objectives of this research is to precipitate a change in the behavior of the public in terms of tornado safety and preparedness actions. A major way to accomplish this change is through policy makers who can effectively alter the public's perceptions on what actions to take in a tornadic situation on a highway.

First, as Lee Clarke and James Short, Jr. (1993) argue, social construction is important in terms of risk, as it helps to classify hazards to the public. Constructionist arguments aid in raising questions of special interests, power, and social conflict. This is most applicable in terms of raising questions over the degree and ability of certain events to cause harm to the public, which then lead to social change through policies or campaigns to raise awareness of the problem and provide suggestions to overcome the existing problem. Policies are typically a reflection of public preferences, which in turn are typically created through newspapers and television. Hazards and potential hazards

are thought to be primarily technical matters that are best left to the experts to examine and resolve.

Some social scientists reject this view of risk, but as William Freudenburg (1993) states, the best predictors are the degree to which people put their trust in science, business, and governmental abilities to manage dangers that they may face. When the public sees an authoritarian figure (media outlets) continually projecting a false perception of personal safety via the KTV or other sources, their perception of risk is effectively altered. The outlets that people trust to tell them the right thing to do are showing images of the wrong thing to do, thus leading to a consistent state of misperception.

Freudenburg continues his argument by attempting to look through individual explanations of risk perception and the risks that individuals perceive to the larger institutional context within which the risks are managed. Freudenburg adopts a Weberian approach to his argument, that the division of labor in a society leads to the inability by members of the public to master all things by rational calculation. We tend to allow "experts" or authority figures to perform our calculations for us, instead of using rationality as a basis for our decisions. This division of labor between the experts and those "in-the-know" creates a larger societal division as the division of labor grows more complex. Therefore, the same division of labor that allows for many of the societal and technological achievements of advanced industrial societies could very well be among the most serious sources of risk and vulnerability.

American culture seems to be based on a feeling of constant fear. Fear drives the economy, support for the government, and the growth of capitalism. This dependence on fear finds its roots in risk and risk perception. Lee Clarke (1988) examines the topic of risk and attempts to explain why some risks are acceptable elements of society and some are not. Clarke begins by drawing divisions between the long accepted psychological aspects of risk which focus primarily on the individual, and sociological aspects of risk which examine risk perceptions beyond the scope of the individual.

Clarke argues that the judgments of the public can be equally as beneficial to society as they can be harmful, in terms of selecting alternatives to a certain risk. The judgments, attitudes, beliefs, and actions of the individuals in terms of risk perception have long been explored by the psychological sciences, but historically ignored by the sociological sciences. He states that there are multiple combinations of organizational networks that decide about risks to the public and how to prevent or approach these risks, which extends greatly beyond the reach of the individual. "But the most important problem with the individualist answers to the question of how risks are accepted is that they provide no explanation of the process through which individual estimation and rank ordering of risks actually influence important issues of assessment, distribution, and mitigation of hazards" (Clarke 1988:24). When institutions and organizations are allowed to determine what is a risk and what is not and how to approach such risks, they appear to be rational and complete in nature. Therefore, legitimization occurs among the members of the society and a socially constructed version of reality is created.

Clarke (1993) also discusses in another article how organizations can be liable for disasters for neglecting the evidence that a disaster could occur or is imminent. He uses the Exxon-Valdez oil spill in Alaska as an example, but we can relate this back to the overpass safety myth. Clarke believes that one reason that the spill occurred was due to institutionalized expectations that led organizations and experts to neglect evidence that failure was likely. This same principle can be used to illustrate that a catastrophe is likely to occur in the United States regarding an overpass and a tornado. All of the evidence suggests that this growing overpass safety myth is going to lead to a major incident involving numerous deaths and injuries. The evidence is there; however, those with the power to at least attempt to curb this behavior remain marginally vocal in correcting this false perception. Clarke argues that specific filters are in place inside such organizations which sift out the bad news regarding decision making processes and allow them to continue with the business at hand instead of addressing the possible negative outcomes of their actions or lack of actions. He expands his argument to include a segment which further illustrates the ideas provided by Freudenburg on the hazards of division of labor. "Experts are characterized by esoteric knowledge. With that knowledge, however, usually comes a set of assumptions about how systems work, how the world is organized, and what is (and is not) important. These assumptions serve experts well most of the time, but also, by necessity, divert their professional gaze away from opinions and facts that may be relevant for reducing risk" (Clarke 1993:305-306).

In terms of the social sciences, the study of risk has traditionally been largely examined by psychology and social psychology. However, there has been a recent surge of interest showing the importance of risk perception in the field of Sociology. Kathleen

Tierney has been one of the more vocal proponents of this surge, and she primarily focuses on the distribution of power that determines susceptibility to certain risks. She conceptualizes the term "risk" for discussion purposes to mean, "'the potential for realization of unwanted, negative consequences of an event' (Rowe, 1977:24)" (Tierney, 1999:217). The objective of her article, "Toward a Critical Sociology of Risk," focuses on discussing:

> "how Sociology can best approach the study of hazard-related phenomena and why the field needs to develop a more critical theoretical perspective that recognizes the roles of power, institutionalized interests, organizations, and the state in the social construction, creation, and allocation of risk" (Tierney, 1999:216-217).

To Tierney, disasters and their associated risks are not just random acts of nature that catch an unsuspecting society totally off-guard and wreak death and havoc upon those in its path. Rather, she argues that disasters and risks are regulated to reflect the representations of those who have the power to determine what are risks and what are not, and the severity of the risk. Individual members of society receive a distorted image of risks and the severity of those risks through organizations and the state, depending on how the risk or hazard is distributed to the public by the company, organization, or agency responsible for relaying the message. Tierney provides several sources which attempt to illustrate how members of the public can have their risk assessments altered by outside influences. As cited by Tierney (1999:220), Johnson and Covello (1987) analyze "how various societal actors, including emergent groups, social movements, business enterprises, government agencies, and professions, shape both the characterization of risk and the selection of risk management strategies." Among these groups listed, we can

include the media, who have a great deal of influence over the public and the individual, and also the disaster subculture of those who live in tornado alley.

In the context of Tierney's article, the overpass safety myth continues because those with the most abundant resources to precipitate change are influenced by money, power, and/or institutional interests. This is how some risks are selected and legitimated throughout society and how some are left to be ignored or put on the back burner. She furthers this argument by explaining that the public sees certain risk perceptions as deriving from scientific analysis, calculations, and study. In fact, the only sources who can afford such analyses of risk are governmental entities and organizations, which then decide how and when the public will receive this information.

A final important point raised by Tierney is the understanding of risk as dynamic, not static as is commonly assumed:

> "Risk analysis is based on the assumption that data from past accidents and disasters can be used to project future risks. This runs counter to what sociologists have long known about risks and hazards, which is that human activity and social change continually modify societal, community, and individual vulnerability levels" (1999:228).

It is true that a society is constantly molding and changing itself depending on information it receives, but what happens when society is still receiving data from past accidents and disasters, such as the KTV? It can be assumed that as society molds, changes, and alters public perceptions of risk, and yet this video and similar videos continue to project an illustration of the wrong actions to take in that situation. As a result, society will retain its false perceptions and the risk of death or injury by the overpass safety myth perseveres.

Ulrich Beck (1999) argues that to comprehend risk in modern society, we should avoid orthodox sociological theories, as classical sociological perspectives written during the development of industrialization do not reflect the complexities of modern "risk societies." He furthers this by stating that both realist and constructivist arguments should be used to examine modern global risks. Realists argue that risk is a "social fact" that can be scientifically examined, while constructivists argue that risk is an imagined reality which is socially constructed and reconstructed by members of a society. The concept of risk is lodged somewhere between security and destruction, where the perception of threatening risks determines thought and action.

Beck continues by arguing that the past loses its power to determine the present. This point is argued by this research because it seems that the past (KTV) is exactly what is determining the present actions by members of society by seeking shelter from tornadoes underneath overpasses. He says that risks exist in the future, yet are constructed in the present. In this case, however, the risks are constructed through both the past and the future. Another argument from Beck is that risk associated with "manufactured uncertainty" reinforces a peculiar synthesis of knowledge and unawareness. Simply put, more and better knowledge, which society typically views in positive terms, is becoming a source of new risks. By concentrating in one or more areas of risk prevention, we notice a lack of concentration in other areas, which are as likely to be risk-prone.

As our knowledge of tornado development and behavior increases, the level of fear seems to decrease among tornado prone areas. In fact, tornadoes have become

entertainment for much of the country and most specifically in regions which encounter high incidences of tornado activity. During the course of this research, several people exclaimed that in their small towns, when the sirens go off, people begin to pull out lounge chairs into the lawn and watch the spectacle unfold, putting themselves at increased risk of injury or death. The overpass safety myth is no exception to this concept.

Several studies attempt to assess the impacts of media on people's perceptions of disasters. The majority of this research focuses on the impact of the mass media on public perception, particularly that of fictitious Hollywood productions of disasters. The most prominent of social scientists to investigate this relationship is E.L. Quarentelli, who in the late 1970's and 1980's produced several articles which deal with this relationship. In the last couple of decades, Quarantelli's research has been furthered by other social scientists who find that his assumptions are true.

One of Quarantelli's preliminary papers with the Disaster Research Center discusses the persuasive powers of the media in terms of theatrical disaster movies and how they impact those who see them in regards to risk perceptions and safety precautions. The published article which came out of this paper, *Realities and Mythologies in Disaster Films* (1985), discusses many of the same issues. For the purposes of my research, his preliminary paper, *Study of Disaster Movies: Research Problems, Findings and Implications* (1980) will be discussed.

Of note is his reference to previous research which states that the public's perception of human and group behavior during a disaster "often reflects mythological

notions and misinformation (Wenger, et. al, 1973)" (Quarantelli, 1980). Further research shows that often times the public officials who oversee disaster preparedness and response share these same misperceptions and incorrect views. Most importantly, Quarantelli finds indications that even personal experience of a disaster has little if any effect on erroneous beliefs (Wenger, James, and Faupel, 1980).

He asks the question: Where do people receive inaccurate information about disasters and from whom do they acquire their mythological beliefs about disasters? To answer this question in terms of the overpass safety myth, the KTV and other media have played a role in this misconception. Quarantelli even postulates that the media, through journalistic accounts via news stories and documentaries, provide a major source of knowledge for the public's awareness of certain disaster issues. Popular culture and the technological advances therein have provided the public with a major outlet for educational and entertainment-oriented viewing of fictitious and documentary-based disaster footage and films. Quarantelli argues that the fictitious Hollywood blockbuster films have perpetuated certain myths. Other research has proven this to be true, however, with the current popularity of "reality"-based television, the public has made a slight transition back to more "reality"-based documentaries and programs.

The KTV would definitely fit into this category of popular culture icons which perpetuate a safety myth, because Quarantelli hypothesizes that "the general population probably has learned some of the things it 'knows' about disasters and disaster behavior from popular culture" (1980:2). Even some other studies in non-disaster related fields show this to be true. Some research into mass communication has "shown that the

American population, as a result of exposure to popular culture, holds beliefs that sometimes vary with, replace, or add to the consistent findings of empirical social and behavioral scientific studies (e.g., Breed, 1958; Klapper, 1960; McQuail, 1969; Bower, 1973; Manning and Pendleton, 1977)" (1980:2).

Quarantelli finds in his research that "disaster movies either perpetuate the wrong ideas according to scientific studies or present empirically incorrect facts" (1980:16). Research for the present study shows that not only is this perpetuated through fictitious movies, but also through actual videotaped experiences that are shown on a large scale around the world. Many of these misperceptions coincide with what disaster research has coined "myths of disaster behavior" (Quarantelli and Dynes, 1973). Further, many of these misconceptions that are conveyed to the public are oriented around appropriate or even possible behavior in particular crisis scenarios. Most people are unfamiliar with what to do if faced with a tornado on an open highway, but one viewing of the KTV provides them with an answer, this research will later show.

Since Quarantelli researched the impact of mass media on public perceptions, further research legitimizes his findings. Bahk and Neuwirth (2000) conducted a study that gauges viewers' risk perceptions of dramatic and documentary-based volcano movies. Their research selected individuals to watch one of three movies: a dramatic theatrical release involving volcanoes, a documentary showing actual volcano footage, and a control film about gardening. They find that viewers of the volcano disaster films show increased levels of fear and worry about falling victim to the disaster that was presented to them.

Their review of the literature shows many examples of the increased levels of risk perception through the media. Of note is research that shows public response to risk and disaster phenomena through the mass media, particularly the mews media (Atwood and Major, 1998; Farley, 1993; Kasperson, 1992; Lombardi, 1997; Stallings, 1997). More applicable research demonstrates how the public responds to a hazard after being reported in news stories in terms of the probability of or victimization by the reported hazard (e.g., Berger, 1998; Brosius, 1993; Gibson and Zillman, 1994; Griffin, Neuwirth, and Dunwoody, 1995; Zillman, et al., 1994).

Bahk and Neuwirth conclude that dramatic depictions of risks and disasters can influence judgments and perceptions of the public under certain conditions. Their review of the literature shows that this is indeed true. The public is influenced by dramatic portrayals of disasters to the point that they can alter public opinions and facilitate debate. This influence is important because often times altered perceptions of risk can lead to social actions for change. This increase in perceived realism can lead to increased ratings of problem seriousness. These two elements combined lead to agenda-setting effects which illustrate the power that the media hold. Members of the public view these movies, become concerned that these disasters or risks may impact them, and thus begin a campaign to change the existing social structure to better protect themselves and other members of their society, all based on the dramatic or documentary film that raised their awareness to an existing risk or threat of disaster.

Finally, Bahk and Neuwirth conclude that people who live in an area that is more likely to experience the type of disaster depicted in the films will have a greater

likelihood of being affected emotionally to what they have watched. The KTV viewed by persons in Hawaii would not have as much of an impact as those who view the video in Oklahoma or any other state located within Tornado Alley. This clearly demonstrates the influence of a disaster subculture, which will be discussed shortly. Not only do dramatic presentations of risks and disasters greatly impact the public, but so too do documentary-based films. These authors advise further research in the area of risk perceptions through documentaries, and the conclusions of this thesis appear to correspond with their suggestion.

Another study which corresponds with the Quarantelli and Bahk and Neuwirth articles conveys many of the same suggestions as well as many of the same findings in the literature. Mitchell, Thomas, Hill, and Cutter (2000) conducted research similar to that of the previously discussed studies, in which they find that the mass media often convey the wrong message to the public in terms of risks and disaster preparedness and response. This research is oriented around continuing the findings and suggestions of Quarantelli and they find that disaster films heighten the awareness of those who watch the movies. However, these films often demonstrate characters performing actions in and around disasters that go against popularly practiced safety precautions with relatively few consequences. This provides the public with the concept that they can combat disaster with a general disregard for safety precautions and sheer heroism alone will guide them through the event unscathed. The KTV demonstrates this very idea. Although seeking shelter in a ditch is the recommended action for personal safety, this video demonstrates individuals performing the ill-advised precautions and successfully weathering the storm.

Thus the persuasive power of the media conveys the wrong message, which is registered by the viewers as the correct safety precaution.

Further, these researchers ask the question, "If the film medium is a source of hazard information for the public, what messages about disasters and hazards do they take away with them, and how do they act on this knowledge?" (Mitchell, et al., 2000:400). This question is the central theme behind this thesis. These researchers discovered that there is rarely an acknowledgement that the characters in the film are simply residing in a hazard prone area and mitigation efforts are necessary to reduce the threat of a particular disaster. There is rarely any mention of how people could possibly recover after the disaster or mitigate against disasters that may occur in the future.

They argue that some aspects of the disaster are simply ignored. Before and after the May 3, 1999, tornado event that ripped apart portions of Oklahoma, people have been killed and seriously injured by seeking shelter from tornadoes underneath highway overpasses. It appears that some type of mitigation efforts would be employed to correct this type of practice, yet the marginally effective campaign currently being utilized is insufficient and more deaths and injuries are sure to occur until this type of official corrective practice takes place. This article provides a review of the literature which supports their findings and the purpose of this thesis. Quarantelli developed his preliminary paper into a published article which finds that the message involving hazards provided through these films are often mixed and inconsistent. Mitchell, et al. argue that much of what people know about disasters comes not from personal experience, but through secondary sources including television media and films, and those who have

directly experienced disasters are usually restricted to only one type of disaster. These researchers urge that, "the subliminal and overt power of film is not to be underestimated (Caldicott, 1991)" (Mitchell, et al., 2000:386).

Some other literature discusses why the public is so vulnerable to altering their perceptions based upon what they see on television and in the theaters. Quarantelli (1985) and others (Webb, Wachtendorf, and Eyre, 2000) argue that the public learns much of what they know about disasters and disaster behaviors through popular culture, and other researchers further this message by linking mass communication research which demonstrates that the media plays a significant role in forming cultural attitudes about risk (Cohn, 1990; Nelkin, 1995).

The research conducted by Rocky Lopes, which specifically analyzes public perception of disaster images, is legitimized through the findings of Krimsky and Plough (1988), and Nelkin (1988) which discovered that television reports commonly focus on dramatic visual stories with an emphasis on the human element of the disaster. Lopes discovered that dramatic visual depictions of disasters have a greater impact on those who view them, and this research shows that television news programs often use dramatic and visual disaster images in their stories. Therefore, it can be deduced that the public's perceptions can be influenced and altered by television news stories and by dramatic depictions of disasters shown on television. Media clips like the KTV demonstrate the point that by airing this video without any type of disclaimer or corrective actions discussed before or after the clip, the public can receive mixed impressions and perceptions of what they should do in a similar situation.

Many researchers attempt to find how the large amounts of disaster imagery that the public is exposed to complements or substitutes for personal experiences in the perception of risks and disasters, and the role of the media in shaping the public's perceptions of risk, especially where the media act as a link between the expert and the layperson (Gregory, 1991). Many of the sources included in this thesis, as well as the thesis topic in general, attempt to shed some light on these topics and provide directions for future research.

One other prominent researcher in the discipline of risk-perception is Lennart Sjoberg from the Center for Risk Research in Stockholm, Sweden. Sjoberg has published many articles which illustrate the importance of risk-perception among members of the general public and the role of the media in this process. One such article is "Risk Perception and the Media," in which Sjoberg in part defends that the media is not wholly responsible for all public perceptions of risk. He does however conclude the following:

> "1.) Media content: The content of the media is far from objective when it comes to risks, but it is also far from being as biased as had often been thought, both in frequency of reporting about and in presentations of hazards. One of the certain shortcomings of media is that they often present facts outside their contexts, and leave to the public to evaluate them.
>
> 2.) Media influence: Yes, the media do influence (some of) our risk perceptions, but they are only one factor among many.
>
> 3.) Availability: Media's most fundamental way of altering people's risk perception is possibly by number and vividness of articles/features. As risk almost always carries some notion of probability and people use availability to estimate this probability, this notion is central to the effect of media on risk perception…" (Sjoberg 2000:44).

Sjoberg argues that risk perception caused by the media may not be as prevalent as previously thought. But there are many types of risk-perception. The kind discussed

in this research involves exposure to a certain medium, and even according to Sjoberg's article, context and availability can assist in the creation of a false public perception.

We can compare this type of behavior directly with the behavior stated in this research. By exposure to the media including the KTV, individuals begin to construct their own versions of reality. This institutional belief that overpasses make for good tornado shelters is a social myth that is perpetuated by exposure to the media and the tornado video. Risk perception is an area of study that has been pervasive in psychological and social-psychological circles for many decades. However, studies regarding the role of the media in this risk perception have become an area of study that has gained recent prominence.

One of the key factors involved in risk research and its involvement with the media can be summarized by the following quotation from Frank Furedi's "Culture of Fear." He quotes a book written by Singer and Endreny in which they argue that a "rare hazard is more newsworthy than a common one" (Furedi 2002:50). What this implies is that the news media are more likely to report on mundane risks and hazards rather than more important wide-reaching ones. More people are at risk from taking shelter from tornadoes under highway overpasses every year, but the summer months reporting on shark attacks gains more notoriety among the members of the press, a risk that is greatly more infinitesimal than that of severe weather risks. Nearly all of the articles provided in this research illustrate the same point. One former journalist echoes this sentiment, "My reporting would have been a lot better if I knew then what I know now about a well-

established body of science that explains why people are so afraid of some relatively low risks and so unafraid of some relatively big ones" (Ropeik 2002:51).

Public Perception of the Media (Media's Influence). Once we have determined the basis for social construction, we can turn to the media's role in this process. There are innumerable publications in journals and books that illustrate the degree to which the public is persuaded by the media. This can be more fully illustrated by a quotation from Robinson and Levy's (1986) book *The Main Source*:

> "Indeed, every weekday, well over 100 million Americans tune into a network or local television news broadcast, and millions more obtain news information secondhand from those who view those newscasts. The emergence of television as a prominent provider of information has fundamentally altered the organization and flow of public information in modern society" (p. 13).

Undoubtedly, the number of Americans who derive their news information from television has increased significantly since 1986. This book simply illustrates how persuasive television news and content can be to many Americans.

Herbert Schiller (1973) states a similar point of view in his book *The Mind Managers,* in which he states:

> "America's media managers create, process, refine, and preside over the circulation of images and information which determine our beliefs and attitudes and, ultimately, our behavior. When they deliberately produce messages that do not correspond to the realities of social existence, the media managers become mind managers. Messages that intentionally create a false sense of reality and produce a consciousness that cannot comprehend or willfully rejects the actual conditions of life, personal or social, are manipulative messages" (p. 1).

Based upon his research, we can deduce that repeated exposure to this behavior, coupled with the lack of corrective information (Lopes 1992), will cause the public to come to the determination that an overpass is the ideal choice for protection from an oncoming tornado on a highway.

This perspective is furthered by David Altheide (1976) in his book, *Creating Reality*. He postulates:

> "…we run our lives according to pictures in our heads. As long as many of these images come from TV news, then the work of transforming events into news is an act of power that touches us all. My research leads me to conclude that news messages have played a significant part in our history and will continue to help shape our future. I think that these messages have a far greater impact than the events they are claimed to reflect. This is why all facets of the news process and news perspective must be understood" (Pp. 11-12).

Altheide helps to show us that the images that we receive from the KTV can alter the perceptions of those who see it. Instead of a lucky group of people who experienced the periphery of a dramatic event, this image has engrained itself as a matter of public safety.

Instead of seeing these people in this video as lucky to have not experienced the full force of a destructive tornado, the public perceives them as having cheated death by their actions, and this furthers the tornado safety myth in the eyes of the public. Many studies conducted on risk perception evaluate media use in relation to public perception, but one article entitled "Journalists, Public Differ On Perception Of Media Coverage," reveals how more research should be done on the growing gap between journalists' and the public's perceptions. This article provides research which shows that "…media perceptions are defined by occupational status, which represents a form of socialization

that can shape personality and perception" (Beaudoin and Thorson 2002:58). To narrow this gap between journalists and news editors and the members of the public that they are attempting to serve, these authors suggest that a re-evaluation of news coverage should take place in addition to the basic roles that they play in creating that news coverage.

This can be a problem when other sources post the following research findings: "The most striking public attitude toward local television is trust…people generally trust local television more than any other type of news" (Mitchell 2004: Retrieved January 10, 2004). If people place all of their trust into television news, and yet are being provided with misleading information, wouldn't this tend to be a bit of a problem? This is the reason that the tornado safety myth persists. What people see to be real is real in how they react to it, as W.I. Thomas would say.

Many examples of research involving the influence of media on individuals has been conducted, most of which support the research saying that people are easily persuaded by what they view on television, in the movies, or in other sources of media (Cook, Kendzierski, and Thomas 1983; Neiman Reports 2002; Ruscio 2000; Wahlberg and Sjoberg 2000; Sjoberg 2004; Sandman 1994; Slovic 1992; Rodriguez, Diaz, and Aguirre 2004).

However, surprisingly little research has been conducted on choices of protective action and causes of delayed responses when the public is confronted with a tornadic threat (Golden and Adams 2000). This same article discusses how current trends show a decrease in the average annual deaths attributed to tornadoes. If this can be extended to an increase in the correction of public perception and behavior of overpass shelter, perhaps this trend can continue to decrease.

Robert Stallings (1990) researched a bridge collapse disaster and discovered several ways in which the news media influenced public perceptions on how the accident occurred and the causes that led up to the event. The sources used by the media can greatly influence the information that the public receives. Much of this information comes from organizations that have a vested interest in the particular risk, accident, or disaster being spotlighted by the media segment. There has been a great deal of research involving public perception of hazards via media coverage and content (See Mazur, 1981; Wilkins, 1986, 1989; Gamson and Modigliani, 1989; Walters *et al*., 1989; Mazur and Lee, 1993), which show how organizational and public discourse regarding risk become embedded through certain models of causation.

Disaster Subculture. The most comprehensive literature on disaster subcultures can be located in a report from the University of Delaware Disaster Research Center. Wenger and Weller (1973) provide the academic world with our first glimpse of a disaster subculture. They continue the work of Harry Moore who first identified elements of a disaster subculture in 1964, when he discussed the defense mechanisms that a community or culture develops to overcome previous disasters and prepare for future events. These mechanisms do not represent the mainstream culture of a society, but only the portion of culture which is manifested under certain circumstances. Those who live in high-risk areas for tornadoes and severe weather have a different level of knowledge when compared to those in other areas. This knowledge is widely known in these regions. However, the subculture of Tornado Alley is typically exposed to this information during high-risk periods of time when severe weather is most likely to occur.

A community's level of response is dependent on the level of past experience in that community (Wenger and Weller 1973), so in locations such as Oklahoma which receive some of the highest concentrations of tornadoes in the world, we can conclude that there is a well-established disaster subculture in this region. Every time a severe weather of tornadic event strikes the area, a residue of thoughts, memories, and emotions is left on the residents. The preservation of these perceptions is engrained within the members of the community and therein lies the disaster subculture. This residue is preserved in the culture and is subsequently passed on to new members of the community as they arrive. This legitimizes the disaster subculture and perpetuates its existence (Wenger and Waller 1973).

These preserved perceptions continue to permeate the society and can spawn secondary subcultures which assist in setting up rules and regulations that help to provide legitimacy to the primary subculture. If we look at this from the perspective of Tornado Alley, Oklahoma specifically, we see that each community has a built-in disaster subculture of tornado preparedness. But what happens when the secondary subculture (overpass safety myth) is perpetuated throughout the primary subculture and happens to be misinformation?

This can be best described by the definitions that Wenger and Waller provide in their article. Valuative elements can help to define what is considered important by prioritizing the activities of the community in a disaster situation. Normative elements define to the members of the subculture how the threat should be perceived, what actions should be taken in specific situations, and how members are to respond to the disaster.

This is illustrated by the official tornado safety tips provided by media outlets and federal agencies that specialize in weather preparedness.

However, beliefs can vary greatly within the culture. Some might believe that certain areas are more likely to be immune from certain dangers (overpasses). This is largely due to the past exploits and legends of others in the community who had first hand experiences which either support or provide an exception to the popularly held ideals. The KTV is one such example. This news crew defied the odds, yet came away with a document (video) that has helped to provide the public with a false perception of what to do in that situation. These types of sub-cultural elements are more manifest in nature, in that they are more fully integrated into the main body of non-disaster culture. The dissemination of the KTV around the world has assisted in creating this manifest aspect of community life, so that even members of the main body of society apart from the subculture receive a false perception of what to do in that specific situation.

A review of the existing literature demonstrates that highway overpass bridges are generally inadequate for protection from a tornado. The behavior of seeking shelter underneath overpasses troubles meteorologists, weather agencies, and storm chasers alike, but the research clearly indicates that television entertainment and news media have a profound impact on the American public, and elements of that media like the KTV reshape perceptions in people. Through this socially constructed version of "reality", people are socialized to perceive external stimuli in different ways. In this case, members of the general public receive the wrong impression from the KTV and it alters their views of what behaviors to perform if faced with a similar situation. A disaster subculture is a defense mechanism for a community or culture, developed to overcome previous

disasters and prepare for future occurrences. The real problem exists where a community develops a disaster subculture that provides the public with information that goes against currently accepted tornado safety precautions. The KTV is an example of information that exists within a disaster subculture in Tornado Alley. It provides viewers with misinformation yet is accepted by the public as an instruction manual for future precautions. The following chapter will present information on the surveys conducted and how the research was organized.

CHAPTER III

METHODOLOGY

Research Methodology

The primary source of data for this research comes in the form of survey data which has been collected from several classes of varying levels attended by students of a major university near the center of Tornado Alley during the 2004-2005 academic year. This research is conducted in a quasi-experimental design which consists of three parts. First, a pre-test is completed by the students and returned to gauge initial perceptions. Next, the KTV is shown to the subjects. Finally, an identical post-test is completed by the students and returned. Through these data it can be determined both the extent to which the media play a role in the public's social construction of "reality" in relation to risk perception, and ascertain the impacts of certain demographic variables on respondents' levels of tornado safety knowledge.

Selection of Subjects

The courses targeted for this research include two sections of UNIV 2001 (University Assessment and Evaluation), ten sections of Introduction to Sociology, one section of Social Problems, one section of Juvenile Delinquency, one section of Quantitative Research Methods, and one section of Environmental Sociology. These courses were selected based upon convenience of access to these groups of students, as well as the knowledge that Introduction to Sociology is one of the more popular

prerequisites for undergraduate students of most degree programs. This would provide data that represent a wide variety of demographics for which to analyze.

Research Instruments

The data for this research are collected by a survey consisting of three demographic-based questions (age, gender, and college of enrollment), and two situation-based questions. The situation-based questions are designed in a multiple-choice format and organized to gauge public perception of common tornado safety precautions. Number four on the survey reads "If you are at home and a tornado is approaching, where would you take cover?"

A.) Interior closet or hallway
B.) Vehicle
C.) Nearest Highway overpass
D.) In a ditch nearest your home

Number five on the survey asks respondents to choose what they would do on the road. "If you are on a highway and a tornado is approaching, where would you choose to take cover?"

A.) Nearest ditch
B.) In your vehicle
C.) In an open field
D.) Under the nearest highway overpass

The correct answer for both of these questions is "A". By correct answer, it is meant that these are the recommendations provided by every federally and state funded weather agency, every emergency management office, and every professional storm-observer/chaser who has published materials on tornado safety precautions.

Question number six is styled in a Likert-scale format and gauges the respondents' self-reported level of knowledge regarding severe weather and tornado preparedness. This question regarding the level of knowledge about tornado

preparedness will help us to understand more fully the degree to which the respondents are interested in the topic or prepared for such an event to occur. "How would you rate your level of knowledge regarding severe weather and tornado preparedness? (**Circle the answer that best applies to you**)"

<_____>

I have no knowledge of severe weather and tornado preparedness	I have little knowledge of severe weather and tornado preparedness	I have some knowledge of severe weather and tornado preparedness	I have a great deal of knowledge of severe weather and tornado preparedness

The final question is open-ended and asks the respondents to list from where they receive their preparedness information. It will be important to provide a question which will gauge the sources from which the respondents gain their knowledge and information. The answers provided have been coded accordingly and are used to determine where most people gain their knowledge of what to do in a tornadic situation. "From where do you receive your severe weather and tornado preparedness information? (e.g. TV news, TV documentaries, radio, brochures, etc.)."

Research Design

A pre-test survey is distributed to provide a base-level analysis of the preconceived perceptions of the topic and of the safety precautions to which the respondents would subscribe if they were involved in a tornadic situation. After the pre-test surveys are collected, the actual full-length segment of the KTV is shown, including the post-production commentary and post-tornado recovery efforts along the highway on which the incident took place. Finally, the same survey is redistributed as a post-test in

order to determine the extent to which the video swayed the perceptions of those who watched it.

Post-Survey Discussion

Following each of these data collection sessions, several minutes of time were allotted for an explanation of the research. The students were informed that "A" on both situational questions (#4 and #5) is the correct answer based on official tornado preparedness tips. They were then led through a discussion of several factors that illustrate why the KTV can be deceitful:

1.) **Fortunate Situation –** The persons under the bridge did not experience the full force of the funnel. The strong winds seen in the video are feeding the actual vortex, which passes just behind them on the embankment. In addition to this, the tornado they encountered has been estimated to be relatively weak. It has been reported that the tornado would be classified as an F-1 to F-2 (73 to157 mph) on the Fujita Scale of tornado destructiveness. One key factor in the fortunate outcome of the participants in the KTV is the distinct construction of the overpass.

2.) **Overpass Construction –** The overpass seen in the KTV was of a specific type of bridge construction which leaves a sizeable crawlspace, which in this case was large enough to conceal and protect three adults and two children. However, most overpasses are not constructed in this manner. Some have flat surfaces on all sides;

some have girders but no crawlspace, and some have small ledges which are not large enough to provide a human being with the necessary protection from a tornado, especially when you take into account the higher wind speeds due to the wind tunnel effect.

3.) **Wind-Tunnel Effect –** A basic principle of physics states that when a fluid is pushed through a constricted area, the velocities increase. An overpass is a good example of this principle. As the winds are pushed into the constricted space underneath the bridge, there is an increase in the speeds of the winds through this area. This can cause the actual wind speeds to be much stronger than those experienced in the more open areas around the bridge. Not only does the wind tunnel effect cause the winds from a tornado to increase, but we also discuss how height can affect wind speeds.

4.) **Height Velocity –** Inside of a tornado vortex, the wind velocities usually increase with altitude. The wind speeds at the surface are typically slower than the speeds at higher levels. So when we look at this safety myth, we can see that members of the public are placing themselves in a dangerous situation in which they are climbing many feet up into a constricted area. This combination causes these individuals to experience conditions that would not be present had they sought shelter in an open low-lying area, decreasing their risk of injury or death.

5.) **Direction change –** As a funnel passes over a specific location, the wind directions can vary greatly depending on the direction of the tornado. On one side of the vortex the overpass may protect the people from flying debris, but as the vortex continues its path the winds typically shift as the circulation passes by. North, south, east and west winds can abruptly change direction in a tornado so that what once protected you can now funnel debris into that constricted area.

6.) **Level of Risk –** The students are shown a map provided by NOAA and SPC statistics, which graphically illustrates the locations within the United States which experience the greatest number of recorded tornadoes within a 1,000 square mile area. One of the two largest groupings of tornado frequency occurs within areas of northern Texas and central Oklahoma. Locations within these areas experience some of the highest concentrations of tornadoes anywhere in the world. Students are informed that this is why they should express interest in this topic, because their proximity to this area causes them to be more likely to experience an event like this than most other people globally.

This was followed by an explanation of the research question, during which they were informed about the false perception of overpass bridges as places of shelter. The subjects were engaged in a brief talk about the power of persuasion held by the media.

Many students indicate that they changed their answers based on what they saw on the video, which assisted in the illustration of media power. A bit of background information was provided in which the events of May 3, 1999, were discussed and how this all related to a false perception of a safety myth. Finally, the subjects were allowed to ask any questions in order to correct their misconceptions regarding tornado safety.

Pilot Study

A pilot study was conducted in the fall semester of 2004 for a graduate class project. This survey was a scaled-down version of the present study, as it included only the first five questions from the current survey instrument (age, gender, college, home, and highway). The survey was distributed to 130 students of UNIV 2001 (University Assessment and Evaluation) and SOC 1113 (Introduction to Sociology). The pilot study provided some basic statistics that show a definite link between the viewing of this video and the altered perception of tornado safety. These data were recoded in the same manner as the current study.

The most glaring result of this survey is the number of respondents who changed their answer from the correct selection of A (Ditch) on the Highway question, to the incorrect answer of D (Overpass), from 48% on the pre-test to 83% on the post-test. These data show an increase of 35% of the respondents who changed their answers based upon having watched the KTV. This figure represents evidence which suggests that the media does indeed negatively influence public perception of tornado safety precautions.

Cross tabulations were employed on these data and there was a trend of non-significance in the findings. The same techniques were used for both the pretest survey and the post-test survey and the variables were tested in the following order:

Pretest	**Posttest**
Age (recoded) * home (correct/incorrect)	Age (recoded) * home (correct/incorrect)
Gender * home (correct/incorrect)	Gender * home (correct/incorrect)
College * home (correct/incorrect)	College * home (correct/incorrect)

Pretest	**Posttest**
Age (recoded) * highway (correct/incorrect)	Age (recoded) * highway (correct/incorrect)
Gender * highway (correct/incorrect)	Gender * highway (correct/incorrect)
College * highway (correct/incorrect)	College * highway (correct/incorrect)

Each of the corresponding tables shows a total lack of statistical significance between the selected variables. All of the Chi-Squares were well above the .05 significance level. It appears that there is not a relationship between these specific demographics and the situational questions. However, when the look at the totals of these 130 surveys we see that each of these demographics were influenced by the video that was shown to them.

Table I – Pilot Test Totals

Pre-Test (N=130)

#4 (Home) – A (Interior Closet or Hallway) = 129 (99.0%)
C (Overpass) = 1 (1.0%)

#5 (Highway) – A (Ditch) = 68 (52.0%)
D (Overpass) = 62 (48.0%)

Post-Test (N=130)

#4 (Home) – A (Interior Closet or Hallway) = 127 (97.6%)
C (Overpass) = 3 (2.4%)

#5 (Highway) – A (Ditch) = 22 (17.0%)
D (Overpass) = 108 (83.0%)

We can see by these totals that one person on the pre-test and three people on the post-test indicate that they would leave their homes in order to seek shelter under an overpass bridge. This particularly dangerous activity places the person at a greater risk of injury or death than if they had stayed in the more solid and sturdy structure of their

home. By leaving the relative safety of their homes, these individuals are subjecting themselves to greater exposure of the tornado's winds.

Despite the fact that the cross tabs did not provide us with any statistical significance, we can still deduce based on the overall totals that the media are indeed a factor in influencing public opinions, beliefs, attitudes, ideas, and actions. The independent variables did not provide us with any clues as to certain demographics that might be predictors of certain behaviors, but the totals do show us that there is perhaps an unknown variable that would more accurately explain or predict the overpass shelter behavior. This pilot test was conclusive enough to warrant further study on this topic and led to the current study.

Data Collection Plan

These data were collected solely by the researcher and the two surveys will be counted and then coded to prepare for data analysis. Coding of these data will allow for easy transfer into a statistical program (SPSS) which will then provide the results. Data will be coded in the following manner:

Table II – Survey Questionnaire Coding

1.) Age – Coded as written (Continuous)
2.) Sex – Male = 1
Female = 2
3.) College – Arts & Sciences = 1
Agriculture = 2
Business = 3
Education = 4
Engineering = 5
Human Environmental Science = 6
4.) Home – Interior Closet or Hallway = 1
Vehicle = 2
Overpass Nearest the Home = 3
Ditch Nearest the Home = 4

5.) Highway – Ditch = 1
Vehicle = 2
Open Field = 3
Under the Nearest Highway Overpass = 4
6.) Level – No Knowledge = 1
Little Knowledge = 2
Some Knowledge = 3
Great Deal of Knowledge = 4
7.) Source – TV News =1
Radio = 2
Friends/Family = 3
TV Documentaries = 4
Personal Experience = 5
Internet = 6
Brochures = 7
Newspapers = 8
Common Sense = 9
School/Education = 10
Weather Shows = 11
Movies = 12
No Source of Information/Blank = 13

Recoding

These survey data have been recoded in order to gather new information on the responses. Age was recoded to illustrate the distinction between traditional and non-traditional students. Subjects who provided responses between 18 and 22 years old were recoded as 1 and these represent the average ages of traditional students at a four-year state university. Those 23 years old and higher were recoded as 2 to highlight the average ages of non-traditional students.

The gender and college variables were left as reported because they were effective in their original states. The two situational dependent variables were recoded to distinguish between the correct and incorrect answers. The correct answers of A on the Home and Highway questions on both the pre and post-tests were recoded as 1, and the rest of the responses (B, C, and D) were recoded as 2 to indicate incorrect answers.

The self-reported level of knowledge response was also recoded to combine the four possible responses into two categories. No or little knowledge responses were recoded as 1, while some to great deal of knowledge were combined and recoded as 2.

Analysis of the Data

Because all of these data are categorical, cross-tabulations were performed. These descriptive statistics will show the percentages of which responses were chosen by certain demographic variables and highlight any relationships between them and the situational variables. In the next chapter, the major findings are discussed and demonstrate a general support of the existing literature.

CHAPTER IV

FINDINGS

Analysis of the data will show that there is a relationship between the KTV and public perception. It will also present several demographic variables which show statistical significance between certain people and their responses. Univariate analysis of the survey results will be discussed, as well as bivariate relationships discovered through cross-tabulations.

The data were calculated to show total number of responses and their percentages of occurrence. These numbers provide some interesting findings. Of particular interest are the majority of females who participated in the study. The campus statistics for Fall 2004 indicate that the female population (48.29%) is lower than that of the male population (51.71%), but this was not evident in the findings, as the results showed that females constitute over 60% of the population, as seen in Table III.

The ages provided by the respondents seem to reflect accurate levels of traditional and nontraditional students. Those between the ages of 18 and 22 were thought to represent the average ages of traditional college students, and thusly represented 86.2% of the survey population. Nontraditional students were categorized into everyone who reported their age at 23 or over. They represented 13.8% of the survey population and appear to be relatively steady with the actual number of nontraditional students.

Table III – Research Totals and Percentages

	Pre-Test N=406		Post-Test N=406
Age	18 to 22 = 340 (86.2%) 23 and higher = 57 (13.8%)	**Age**	18 to 22 = 340 (86.2%) 23 and higher = 57 (13.8%)
Gender (sex)	Male = 160 (39.5%) Female = 246 (60.5%)	**Gender (sex)**	Male = 160 (39.5%) Female = 246 (60.5%)
College	A & S = 230 (56.7%) Ag. = 17 (4.2%) Bus. = 59 (14.5%) Edu. = 43 (10.6%) Eng. = 19 (4.7%) HES = 38 (9.3%)	**College**	A & S = 230 (56.7%) Ag. = 17 (4.2%) Bus. = 59 (14.5%) Edu. = 43 (10.6%) Eng. = 19 (4.7%) HES = 38 (9.3%)
Home	A (Clos./Hall.) = 391 (96.3%) B (Vehicle) = 2 (.5%) C (Overpass) = 2 (.5%) D (Ditch) = 11 (2.7%)	**Home**	A (Clos./Hall.) = 378 (93.2%) B (Vehicle) = 0 (0.0%) C (Overpass) = 16 (3.9%) D (Ditch) = 12 (2.9%)
Highway	A (Ditch) = 197 (48.0%) B (Vehicle) = 18 (4.8%) C (Field) = 1 (.2%) D (Overpass) = 190 (47.0%)	**Highway**	A (Ditch) = 51 (12.0%) B (Vehicle) = 7 (2.8%) C (Field) = 1 (.2%) D (Overpass) = 347 (85.0%)
Level	No = 8 (3.0%) Little = 38 (9.0%) Some = 257 (63.0%) Great Deal = 103 (25.0%)	**Level**	No = 5 (1.2%) Little = 37 (9.0%) Some = 260 (64.0%) Great Deal = 104 (25.8%)

The College of Arts & Sciences has the highest enrollment of any college at this university. The number of undergraduate Arts and Sciences students who responded shows this fact, but the numbers still show a heavy population of A & S students. The campus percentage of undergraduate A & S students is about 30% of the total undergraduate population, yet on this survey the total percentage of A & S students is 56.7%. Colleges that appear to be underrepresented are Agriculture, Business, and Engineering.

Similar to the pilot test is the number of respondents who correctly answered the home safety question. Ninety-six point three percent (96.3%) correctly answered the question on the pre-test, while 93.2% responded correctly to the same question on the post-test. Of particular interest on this question is the number of responses that indicate individuals who would leave their homes to seek shelter under an overpass. Only two people (.5%) responded that they would take this action on the pre-test, but after the video, this number increases to sixteen (3.9%). This supports the reports that surfaced after the May 3, 1999, tornado outbreak in which several members of the community participated in this behavior.

As previously discussed, the highway question showed similar outcomes as that of the pilot test. The pre-test showed a 48% (Ditch) to 47% (Overpass) split. After the video was shown to the students, this differential increases dramatically. Eighty-five percent (85%) responded that they would seek shelter under an overpass bridge, while the number of students who would still select the correct option of seeking shelter in a ditch or low lying area dropped to 12%. This total appears to support the hypothesis that the KTV and similar media can influence peoples' perceptions of what to do if faced with that type of situation.

Another interesting finding was the self-reported level of knowledge claimed by the participants. Eighty-eight percent (88%) of those surveyed stated on the pre-test that they had a great deal or some knowledge of tornado and severe weather preparedness. This number increases slightly on the post-test to 89.8%, and yet when we look at the number of incorrect answer on the post-test, we see that there is a deficiency in their tornado preparedness precautions. Eighty-eight percent (88%) selected the wrong answer

on the highway question, yet 89.8% of the sampled population claim to have a great deal or some knowledge of tornado preparedness. This demonstrates a deficiency in tornado safety education among this subculture. It also demonstrates the power of the media in terms of public persuasion on a topic they claim to be familiar with, yet they are convinced to perform the wrong actions in that situation.

The findings of this research have shown a similar outcome as that of the pilot study. The totals of this survey illustrate many of the same changes of opinion based on the viewing of the KTV. These totals show that 38% of the respondents changed their answers from the correct option (A) to the incorrect option (D). This is three percentage points higher than that of the pilot study, but with a much larger N. This demonstrates the value of the pilot study and provides a measure of reliability for the instrument.

The cross tabulations that were performed on these data did show some statistical significance in the following categories:

Pre-Test	**Post-Test**
Home * Level	Home * Level
Highway * Gender	Highway * Age

A person's self-reported level of knowledge of tornado preparedness was a statistically significant factor in their decision of where to seek shelter when faced with a tornado at home. The majority of both groups selected the correct answer, but those who claim little or no knowledge were more likely to make an incorrect decision ($p < .05$).

Table IV - Pre-Test Home Safety * Level of Knowledge Cross-Tabulation and Chi-Square

		Level of Knowledge	
		Little or No Knowledge	Great Deal or Some Knowledge
Home Safety	Correct	N = 41 (89.1%)	N = 350 (97.2%)
	Incorrect	N = 5 (10.9%)	N = 10 (2.8%)
Pearson Chi-Square		7.506	p<.05

It also appears that there is a relationship between a person's sex and highway safety. Males were more likely to make the wrong decision than females, who were more likely to make the correct decision of seeking shelter in a ditch ($p < .05$). It is unclear at this point why this relationship occurs. Further analysis of this data and the literature could provide more in-depth explanations on this finding.

Table V - Pre-Test Highway Safety * Sex Cross-Tabulation and Chi-Square

		Sex	
		Male	Female
Highway Safety	Correct	N = 65 (40.6%)	N = 132 (53.7%)
	Incorrect	N = 95 (59.4%)	N = 114 (46.3%)
Pearson Chi-Square		6.593	p<.05

The post-test shows two more relationships that showed statistical significance. The relationship between home safety and level of knowledge showed a stronger significance than that of the pre-test ($p < .05$). This again shows that those who claim little or no knowledge would be more likely to make an incorrect decision to take shelter, while those who claim to have a measurable degree of preparedness knowledge would make the correct decision the majority of the time.

Table VI - Post-Test Home Safety * Level of Knowledge Cross-Tabulation and Chi-Square

		Level of Knowledge	
		Little or No Knowledge	Some or Great Deal of Knowledge
Home Safety	Correct	N = 32 (76.2%)	N = 346 (95.1%)
	Incorrect	N = 10 (23.8%)	N = 18 (4.9%)
Pearson Chi-Square		20.870	p<.05

On the post-test we also notice a new relationship between the age of the participants and their highway safety decision ($p < .05$). Traditional students are more likely to take the incorrect actions when facing a tornado on a highway. Although both age groups provided mostly incorrect answers, those 18 to 22 years of age were more likely to select an incorrect answer after the video was shown. They were more influenced and persuaded by the media clip than those who represented non-traditional students (23+).

Table VII - Post-Test Highway Safety * Age Cross-Tabulation and Chi-Square

		Age	
		18 to 22	23 or Higher
Highway Safety	Correct	N = 37 (10.6%)	N = 14 (24.6%)
	Incorrect	N = 312 (89.4%)	N = 43 (75.4%)
Pearson Chi-Square		8.693	p<.05

All of these data suggest that the media does in fact play a role in altering the public perceptions of tornado safety myths. The totals and the cross tabulations demonstrate that there is in fact a link between the media and false public perception of videos like the KTV as a source for tornado preparedness.

Scientific research and study by meteorologists, state and federal agencies, and storm chasers have determined that overpasses usually provide insufficient shelter for proper protection from most tornadoes. The literature supports this statement by revealing innumerable resources which demonstrate an active voice in addressing the problem. By the problem being discussed, it has become defined as a problem and researchers from multiple disciplines have made the existence of the problem marginally visible. Now the problem has been defined and legitimated, yet this safety myth is still perpetuating itself throughout Tornado Alley and the associated disaster subculture.

Social construction of reality has occurred in which members of the public now take a dramatic video and base their precautions and preparedness off of what they see. If we define situations as real, then they are real in their consequences. The false perception of proper tornado safety precautions is a version of reality for those who are exposed to certain media like the KTV. This conclusion can be defended by way of these data which illustrate a large grouping of people who consider themselves somewhat or very knowledgeable about severe weather and tornado preparedness, yet still are easily persuaded by the KTV. Despite how involved in a subculture the public is, the media still have high levels of influence. This is evident by the 38% increase of incorrect answers regarding tornadoes and highway overpasses.

The public watches this video through the media, an institution with incredible power and influence over the masses. The literature demonstrates that the media have very high levels of influence over the perceptions of the public, especially in terms of risk. Risk perception is largely regulated through the media via print, films, documentaries, and entertainment and reality programs. It is through the media that the

KTV permeates into the community and is subsequently internalized through exposure to the video itself. The video was internalized enough by the participants in this research to increase the post-test incorrect highway responses by 38%.

The KTV is legitimized by receiving acclamation through receiving awards and widespread dissemination through other media outlets around the world. It is other media outlets that provide these accolades, legitimizing themselves in the public through the power that they hold in shaping societal opinions. Part of this public acceptance is the presence or development of a disaster subculture.

A disaster subculture is designed to help and assist members of a community by raising awareness of local risks through learning from past experiences and preparing for future occurrences. A problem can develop when an element of that disaster subculture demonstrates an activity that goes against recommended safety precautions and becomes dispersed within that subculture. The entity created to assist the society is now unknowingly working against the basic tenets of the disaster subculture. When an element of a subculture provides the public with misinformation, it can be detrimental to society. This is evidenced by the linkage between those who feel a part of the tornado disaster subculture by marking that they are somewhat or very knowledgeable on tornado safety precautions and those who still change their answers after viewing the KTV. In regards to the highway variable, a near-split on the pre-test results lead to a 73% differential on the post-test, after having viewed the video. This means that about half the respondents would get in a ditch as is recommended, and half would utilize the overpass bridge for shelter. After the video, however, only 12% would take the

recommended action of ditch shelter, while 85% would attempt to duplicate what they saw on the KTV.

Based upon the statistical research and review of the literature, we can determine that the media play a significant role in the social construction of reality in terms of risk perception. We can also determine that relationships exist between age, sex, and self-reported level of tornado safety knowledge and the decisions that the respondents would make if faced with a tornado at home or on a highway. Certainly, exposure to the media and demographic variables can influence the decisions that people make.

CHAPTER V

CONCLUSION

Summary

This research has shown several examples of how the publics' perception of tornado safety precautions can be influenced and altered through exposure to the media. The totals of the pilot test and this study, as well as the cross tabs that were conducted, show a direct relationship between the media and the perception of a tornado safety myth. The literature shows that this persuasion happens on many levels in a society, and this example assists in demonstrating the persuasive and manipulative powers of the mass media. Not everyone was persuaded by the video shown to them, but the majority was influenced to alter their opinion.

Limitations of the Study

As with all research, this study has some limitations. Some of them, however, can also be looked at as advantages. For example, the fact that this study was collected at only one university in the middle of the country could be an argument against the concept that this study is representative of national trends. However, this study is conducted in the heart of Tornado Alley, which will measure the perceptions of a disaster subculture, or those who are socialized to have a certain degree of knowledge regarding tornado

safety precautions. A person from a state which receives relatively low or zero risk for tornadoes would have a different perspective about tornado safety than a person from a state or region which experiences regular exposure to this type of dangerous weather.

An important limitation here is that the respondents are providing a self-reported level of knowledge. There is no standard to accurately measure a person's level of knowledge regarding tornado safety. Simply because individuals reported having a great deal of knowledge regarding tornado safety precautions, does not necessarily mean that they in fact are very knowledgeable. Conversely, persons who responded with little or no knowledge may in fact be more knowledgeable on the subject than some who responded as having some or a great deal of knowledge. This illustrates the difficulty involved in interpreting the self-reported levels of knowledge on a topic. This demonstrates a vulnerability of knowledge in which we think we are very knowledgeable about tornado safety precautions, but in fact what we know comes from what we have heard and seen, some of which demonstrates ill-advised precautionary methods.

Although this research does focus on the disaster subculture of the region, other limitations show that the responses collected do not represent national or regional trends due to the population sampled. The ages of those who responded ranged from 18 to 60, with the vast majority falling within the range of traditional college students (18 to 22). This age range does not reflect the total population due to the limited range. It does not account for those below 18 years of age and only records a handful of those who are older. This does not represent the population of the United States nor does it reflect the population of the Tornado Alley region.

The selection of mostly Sociology classes can also be seen as a limitation by some. Although the respondents were heavily weighted towards Arts and Sciences students, Introduction to Sociology (SOC 1113) is a popular prerequisite general education course for all academic colleges at the university where the research was conducted. The selection of these courses would provide data that would encompass students from all colleges and are similar to university totals.

When we look at the percentage of the population of the United States who have received some college or a college degree, we notice that the national trend as of 2002 of those 25 years or older is 17 % with some college, 26% with Associates or Bachelors degrees, and 9% have an advanced degree. (U.S. Census Bureau) This research involves college students who represent a minority of the population. These numbers do not reflect national or regional trends.

The use of gender as a demographic could yield some confusion for certain participants. In the social sciences it is instructed that gender is a state of mentality brought on by socialization, not a biological sexual orientation. A person's gender reflects how they feel about themselves sexually, not whether or not they are biologically assigned male or female genitalia. This question should be reworded as "Sex" instead of "Gender" to alleviate this possible confusion.

The situational question on the survey regarding home safety (#4 on the questionnaire) does not adequately provide enough options for the variety of living options available. The number of respondents who selected D (Nearest Ditch) on both the pre-test and the post-test was at first alarming. Further thought on this result raises interesting questions about home structure. This response would be the best option for

those living in mobile and manufactured homes. An underground shelter would be ideal, but of the options listed, nearest ditch would be the most applicable. Further research should include options or questions that are more applicable to those who live in mobile and manufactured housing.

Conclusions

The media do play a significant role in the perceptions and opinions of the public. In this research, the KTV did alter the perceptions of the public in terms of tornado safety precautions, directly corresponding with previous research showing increased public risk perceptions after viewing a news reports on a specific hazard (Berger, 1998; Brosius, 1993; Gibson and Zillman, 1994; Griffen, Neuwirth, and Dunwoody, 1995; Zillman, et al., 1994). This video did confuse people on what to do in a similar situation, demonstrating a correlation with other research showing the influence of the media on risk perception (Atwood and Major, 1998; Farley, 1993; Kasperson, 1992; Lombardi, 1997; Stallings, 1997). This video assists in altering the secondary subculture to disseminate misinformation and allows the disaster subculture to be wrong in its approach to the problem. Lack of action by the media helps to perpetuate the persistence of this misconception.

This research appears to correspond with that conducted by Quarantelli (1980), Bahk and Neuwirth (2000), and Mitchell, Thomas, Hill, and Cutter (2000). This research has demonstrated that a media clip from a documentary can alter their perceptions of the risk and of what actions students would take if faced with a tornado on an open highway. The previous studies focused primarily on fictitious, big-budget feature films and their impact on the public. Bahk and Neuwirth (2000) found that documentaries do produce

similar patterns of persuasion to that of Hollywood disaster films, and this research supports their findings.

Recommendations for Future Research

The purpose of this research is not to place blame or fault on any one source or group. The purpose is to raise awareness of a growing problem, understand what is causing this behavior to perpetuate itself, and correct the false public perception of a particular tornado safety myth.

The incorporation of an additional study which analyzes various learning theories would be beneficial to the interpretation of the data. It was not discussed in great detail in this research, but the fact that people learn in different manners (visual, auditory, and kinesthetic) could have a significant impact on the design of the research instrument, the outcome of the results, and analysis of the data. Different learning styles can have a great impact on people's ability to observe, retain, and utilize information presented to them. Tying directly in with the Berger and Luckmann concept of the social construction of reality, the degree of reality can differ from individual to individual. Utilizing these different learning styles could possibly provide a more standardized measure of perceptions from this presentation. The Lopes study discussed earlier and similar works have concluded that people are more likely to remember roughly 50% of what they both hear and see. Estimates also indicate that if people can hear, see, and experience something, they are likely to remember almost 100% of the material presented to them. A combination of these learning styles would be the most effective tool for getting the point across to the public.

The correction of the survey instrument as discussed in the limitations section would be appropriate for further exploration of this issue. A more standardized version of measuring self-reported levels of knowledge on a subject would be an important addition. Since the perceived level of knowledge varies greatly between people, a more accurate gauge of this perception would be advised through a standardized instrument used to more accurately identify self-reported levels of knowledge. In addition to this, rephrasing the gender question could lessen any possible confusion on the part of the respondents.

Meteorologists for agencies, companies, and news stations devote their lives to understanding the weather and protecting the public from dangers associated with it. They are not responsible for creating this myth, but they have a large degree of ability to assist in the correction of this myth. It is undeniable that some meteorologists do attempt to raise awareness on this topic, but a more consolidated effort among all meteorologists is necessary to have an effective result on public opinions and behaviors.

The survey questionnaire showed that 89% of the respondents receive their severe weather and tornado preparedness information from television media, which corresponds with research conducted by Robinson and Levy (1986) demonstrating the public's reliance on television. These data indicate that television news and media have the attention of most college aged people, and this is one key area to focus on for correction of the tornado safety myth. Other areas that deserve some attention are schools and educational outlets. For decades, local news meteorologists have been presenting information in many local private and public schools. Eighteen percent (18%) of the respondents reported that they received their severe weather and tornado preparedness

information from these presentations. Undoubtedly, more students attended these presentations but do not remember them.

Television weathermen perform countless numbers of these presentations on a yearly basis, which would be one other important method for disseminating information regarding the overpass safety myth. It is unclear at this point as to whether the meteorologists include the overpass safety myth in their presentations, but utilization of the different learning styles in relation to the safety myth could alter the perceptions of the public from a young age. Incorporating the visual elements of the KTV or similar video, a PowerPoint presentation outlining the problem, and narration by local meteorologists would have a greater chance of altering false perceptions of tornado safety.

It is the intent of some media outlets, agencies, and meteorologists to alter this tornado safety myth. They present this information to the public with the intent of altering their behaviors. However, actual behaviors in tornadic situations demonstrate that there is still an element of confusion related to overpass shelter. The intended behavior is safely evading the tornado all together or seeking shelter in a sturdy building. The actual behavior noticed in these situations is people stopping their cars on the highway and climbing underneath bridges. A more focused campaign could turn the actual negative behaviors into those which were intended in the first place, which are proper highway tornado safety precautions.

Members of the media have an incredible task that comes with the occupation. This task involves understanding the levels of influence that they possess over the public (Mitchell 2004), and one key role of the media is to protect the public from inherent

dangers. With a level of public duty such as this, it should be important for the media to take more responsibility for their actions regarding this safety myth. This is especially true when literature (Altheide, 1976; Nelkin, 1988; Cohn, 1990; Gregory, 1991; Sjoberg, 2000), demonstrates their degree of power and influence over the public. The news media have the responsibility of presenting information to the public while attempting to protect the masses from risks and hazards that they may encounter, thus leaving them with the important task of accurately and effectively disseminating information vital to the safety of those who rely on them. Meteorologists in many areas become celebrities and are seen as local stars in their own right. This is important to Freudenburg (1993) because of his view that people place their trust in certain social institutions to manage dangers they might face. The meteorologists hold a level of trust with the communities in which they work and this sense of familiarity provides local meteorologists with a increased level of responsibility to keep the public safe. This also increases the degree to which the public will alter their behaviors based upon the information presented to them by those they trust. The literature clearly shows this influence and demonstrates that the media must be more actively involved in correcting false perceptions because they help to classify hazards to the public (Clarke and Short 1993).

Future research could continue the ideas presented in this study, but could accumulate larger numbers of participants from a more broad population of the United States, which would more accurately depict the attitudes, beliefs, and persuasive nature of the rest of the country in addition to the Tornado Alley region. Of particular interest would be a comparison of this study with one conducted outside of Tornado Alley and away from the tornado subculture as described by Wenger and Weller (1973). The

impact of the media and perception of tornado preparedness may vary depending on geographic location, and a larger study would help explore these differences and focus more on where and how to correct the overpass safety myth.

In summary, there are two key primary policy implications that are suggested. Specifically, local media, including meteorologists, should undertake a more active and widespread campaign to alter this tornado safety myth. The trust and familiarity held by the general public places a great deal of responsibility squarely on their shoulders (Freudenburg, 1993). The television and radio stations, in combination with newspapers, magazines, and local emergency management offices have an incredible amount of power and influence to alter false public perceptions. A combined campaign from these sources can alter the disaster subculture from the inside out.

Methods for achieving this could include: multiple special segments on the local television news regarding the safety myth and proper precautions; including a special segment in traveling weather shows and school presentations devoted to the topic; multiple news articles in the paper regarding the issue; public service announcements on the television, radio, and in printed media presenting the issue and corrective information; brochures or pamphlets specifically targeting this behavior; documentaries or movies dealing with the overpass safety myth; websites devoted to altering the false public perception of the topic; or placing warning signs on the sides or underneath overpass bridges to discourage people from seeking shelter in those locations.

Generally speaking, the media has an incredible amount of responsibility that comes with the amount of power that they possess. The literature clearly shows that this power is evident and the media have the abilities to alter the ways in which people think,

feel, act, perceive, and behave. The media has a public duty to provide information that will be entertaining, since ratings are what keep them in business, but at the same time they must provide information that enables the public to be safe and keep themselves out of harms way. The level of trust that the public places on the media requires that this public duty does not go ignored. A consolidated effort on the part of all media sources, agencies, and scientists can ensure that this dangerous trend will shrink. Tornadoes will always take lives. There is nothing that can be done to keep people from dying in tornadoes, but these suggestions could help to minimize those deaths and enable the public to be properly prepared to take precautions that will maximize their chances of survival.

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Oklahoma State University Institutional Review Board

Date:	Wednesday, April 06, 2005
IRB Application No	AS0578
Proposal Title:	The Impact of the Media on False Public Perception of Tornado Safety Precautions
Reviewed and Processed as:	Exempt

Status Recommended by Reviewer(s): Approved Protocol Expires: 4/5/2006

Principal Investigator(s

Jeff Bartlett
824 S. Monroe
Stillwater, OK 74074

Gary Webb
032 Classroom
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 415 Whitehurst (phone: 405-744-5700, emct@okstate.edu).

Sincerely,

Sue C. Jacobs, Chair
Institutional Review Board

VITA

Jeffrey N. Bartlett

Candidate for the Degree of

Master of Science

Thesis: THE IMPACT OF THE MEDIA ON FALSE PUBLIC PERCEPTION OF TORNADO SAFETY PRECAUTIONS

Major Field: Sociology

Biographical Information:

Personal Data

- Born May 3rd, 1976 in Tulsa, Oklahoma. Interests and activities include:
  - Historical research with an emphasis on Oklahoma
  - Severe weather photography and videography
  - Volunteer Work in Summer and Fall 2003 with the Gatesway Foundation
  - Working with computers, cameras, and technological gadgets

Education

- Master of Science in Sociology degree at Oklahoma State University, July, 2005
- B.S. in Sociology from Oklahoma State University, 2003
- Minor in History
- Graduated High School from Metro Christian Academy, Tulsa, Oklahoma, 1994

Employment Experience

- University Academic Services Graduate Student Assistant – 1 year
- Cook – 8 years
- House Painter – 1 ½ years
- Industrial Equipment Outside/Inside Sales – 2 years
- OSU Meeting Services Set-Up Crew – 1 year

Professional Memberships

- Student Member of Mid-South Sociological Association

Name: Jeff Bartlett Date of Degree: July 2005

Institution: Oklahoma State University Location: Stillwater, Oklahoma

Title of Study: THE IMPACT OF THE MEDIA ON FALSE PUBLIC PERCEPTION OF TORNADO SAFETY PRECAUTIONS

Pages in Study: 80 Candidate for the Degree of Master of Science

Major Field: Sociology

Scope and Method of Study: This study reports the findings of college students who completed questionnaires to gauge their perceptions of tornado preparedness and the impact of a video clip showing the wrong safety precautions being successfully employed.

The primary source of data for this research comes in the form of survey data which has been collected from several classes of varying levels attended by students of a major university in Tornado Alley during the 2004-2005 academic year. This survey data was coded and statistical methods were performed to search for any statistical significance that may show a connection between certain independent variables when compared to a couple of dependent variables.

Cross-Tabulations are performed in an attempt to discover the relationship between the independent and dependent variables. When the data are compared between the independent variables age, sex, college of enrollment, source of information, and self-reported level of preparedness knowledge, and the dependent variables of home safety and highway safety, the resulting information provides the researcher with data that could reflect certain trends of susceptibility.

Findings and Conclusions: These data suggest that the media does in fact play a role in altering the public perceptions of tornado safety myths. The totals and the cross-tabulations demonstrate that there is in fact a link between the media and false public perception of the Kansas Turnpike Video (KTV) as a source for tornado preparedness.

The media does play a significant role in the perceptions and opinions of the public. The Kansas Turnpike Video and similar media do alter the perceptions of the public in terms of tornado safety precautions. This and other videos do confuse people on what to do in a similar situation. This video helps to alter the secondary subculture to disseminate misinformation and allows the primary disaster subculture to be wrong in its approach to the problem. Lack of action by the media helps to continue the persistence of this misconception.

ADVISER'S APPROVAL: Dr. Gary Webb